

AMENDMENTS TO THE CLAIMS:

This listing of claims will replace all prior versions and listings of claims in the application:

1-51 (Cancelled)

52. (Currently Amended) A control apparatus for an extracorporeal blood circuit, said extracorporeal blood circuit being connected to a blood purification machine, said extracorporeal blood circuit further comprising an arterial branch connected to at least one blood treatment element and a venous branch connected to at least one blood treatment element,

the control apparatus comprising:

a non-invasive device for measuring a blood temperature, ~~according to claim 33.~~

said non-invasive measuring device comprising:

a line fitted in the arterial branch upstream of said blood treatment element for receiving blood from a patient,

a temperature sensor connected to said line and generating a first signal indicative of a first blood temperature of the blood flowing in said line, said temperature sensor having an electromagnetic radiation intensity measuring device, and said line having a connecting portion of discoid shape facing said electromagnetic radiation intensity measuring device, said connecting portion being permeable to electromagnetic radiation in a first wave band, said first signal corresponding to an intensity of said electromagnetic radiation in said first wave band,

a temperature regulating device for regulating the blood temperature in the extracorporeal blood circuit, said device being connected to a portion of the venous branch downstream from said blood treatment element, and

a control unit connected to the temperature regulating device and configured to regulate a blood temperature in the extracorporeal blood circuit as a function of the first blood temperature and a reference temperature.

53. (Cancelled)

54. (Currently Amended) An apparatus according to claim ~~53~~ 52, wherein said regulating device, is combined with said portion of the venous branch to form a heat exchanger; ~~said control unit being connected to said temperature regulating device.~~

55. (Currently Amended) An apparatus according to claim ~~53~~ 52, wherein said temperature regulating device comprises a line for conveying a fluid which can be heated to a fluid temperature lying within a specified range, about 37°C.

56. (Currently Amended) An apparatus according to claim ~~53~~ 52, wherein said temperature regulating device has a seat configured to house said portion of the venous branch.

57. (Currently Amended) An apparatus according to claim ~~53~~ 52, wherein said extracorporeal blood circuit is connected to a pump to convey the blood along the extracorporeal blood circuit, the apparatus comprising a sensor for detecting an operating state of the pump; the control unit keeping the fluid temperature substantially equal to said predetermined temperature when the pump is not in operation.

58. (Currently Amended) An apparatus according to claim ~~53~~ 52, wherein said venous branch has a post-dilution node; said portion of the venous branch being located downstream of said post-dilution node.

59. (Currently Amended) An apparatus according to claim ~~53~~ 52, wherein said blood treatment element comprises a hemodialysis filter, said hemodialysis filter comprising a blood compartment and a dialysate compartment within which a dialysate flows.

60. (Currently Amended) An apparatus according to claim ~~53~~ 52, wherein said blood treatment element comprises a hemodialysis filter comprising a blood compartment and a dialysate compartment within which a dialysate flows, and a pre- or post-dilution node for the introduction of a replacement fluid.

61. (Currently Amended) An apparatus according to claim ~~53~~ 52, wherein said blood treatment element comprises a hemofiltration filter.

62. (Currently Amended) An apparatus according to claim ~~53~~ 52, wherein said blood treatment element comprises a hemofiltration filter and a pre- or post-dilution node for the introduction of a replacement fluid.

63. (Currently Amended) An apparatus according to claim ~~53~~ 52, wherein said control unit regulates the blood temperature in the extracorporeal blood circuit as a function of the first blood temperature and the reference temperature at predetermined time intervals.

64. (Currently Amended) An apparatus according to claim ~~53~~ 52 or 63, wherein said control unit regulates the overall temperature as a function of the difference between the first blood temperature and the reference temperature.

65. (New) An apparatus according to claim 52, wherein said measuring device is housed within a casing, the measuring device being configured behind a window formed in said casing; said connecting portion of discoid shape being completely superimposed on said window, to cover a solid angle of view of said measuring device.

66. (New) An apparatus according to claim 52, wherein said measuring device comprises a thermopile having at least one hot junction and at least one cold junction.

67. (New) An apparatus according to claim 66, wherein said temperature sensor comprises a temperature controller, said temperature controller maintaining the at least one cold junction at a controlled temperature.

68. (New) An apparatus according to claim 67, wherein said temperature controller comprises:

- a thermistor connected thermally to the cold junction of said measuring device, said thermistor supplying a second signal, said second signal corresponding to said controlled temperature;

- a solid state heat pump, having a low temperature surface thermally connected to said measuring device and a high temperature surface; and

- a control circuit connected to said thermistor, the control circuit configured to receive said second signal, said control circuit also being connected to said heat pump to supply a control signal correlated with said second signal.

69. (New) An apparatus according to claim 68, wherein said heat pump comprises a Peltier cell.

70. (New) An apparatus according to claim 69, comprising a heat sink element placed in contact with said high temperature surface of said heat pump.

71. (New) An apparatus according to claim 70, wherein said controlled temperature is a constant temperature in the range from 5°C to 15°C.

72. (New) An apparatus according to claim 52, wherein said connecting portion is made from a material which, in said first wave band, has a substantially constant transmittance and an absorbance substantially equal to zero.

73. (New) An apparatus according to claim 52, wherein said connecting portion is made from a material having an essentially constant transmittance in a temperature range from 30°C. to 40°C.

74. (New) An apparatus according to claim 52, wherein said connecting portion is made from a material chosen from a group including high-density polyethylene, low-density polyethylene, and poly(4-methyl-1-pentene).

75. (New) An apparatus according to claim 52, further comprising a filter interposed between said measuring device and said connecting portion of said line.

76. (New) An apparatus according to claim 75, wherein said filter comprises a sheet of material being substantially opaque to electromagnetic radiation outside a second wave band and lying within said first wave band.

77. (New) An apparatus according to claim 76, wherein said second wave band is in a range from 8 μ m to 14 μ m.

78. (New) An apparatus according to claim 76, wherein said filter includes germanium.

79. (New) An apparatus according to claim 76, wherein said filter has one face facing said connecting portion of said line.

80. (New) An apparatus according to claim 76, wherein an infrared radiation band includes at least a portion of said first wave band.